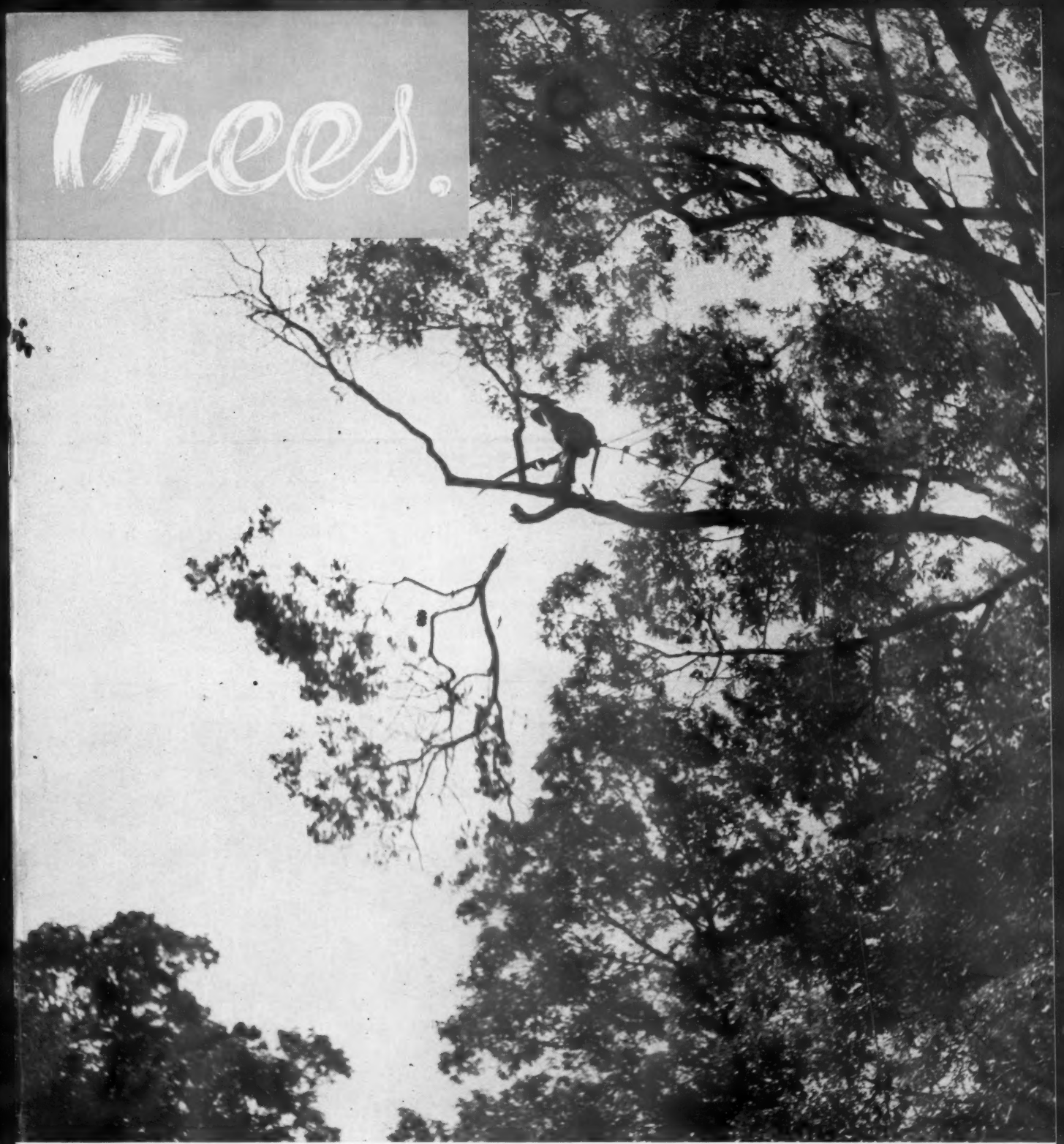
Trees.



A "Skinner" Jumping A Big Limb Clearing Lines —Photo Courtesy T. D. Neil

23rd National Shade Tree Conference, Cleveland, August 18th to 22nd

Particle or Droplet Size of Insecticides — ***S. F. Potts***

The Legend of the Dogwood Tree — ***Cecyl L. Hammond***

July-August, 1947 *The Journal of American Arboriculture* Vol. 7—No. 5

★

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Years

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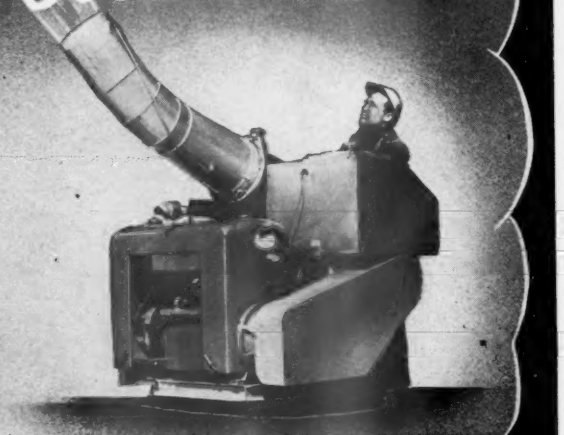

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Greenfield, Mass.

TREES Magazine is a bi-monthly Journal published at Cleveland, Ohio, by Edward H. Scanlon, and is devoted to the furtherance of the technical and business administration of Trees (Street and Ornamental); Parks (Municipal and National); and Forests (State, National and Private), in the U. S. Scanlon Publishing Co., P. O. Box 5607, Cleveland, Ohio. Subscription by mail $2 per year; outside United States, $2.50. Advertising rates upon inquiry. Unsolicited manuscripts must be accompanied by return postage.

ALONG THE WAY

With . . .
EDW. SCANLON

● BOWERS "groaned" them INTO SUBMISSION at the banquet of the WESTERN CHAPTER last month IN BERKELEY. DANA in addition to being a capable LANDSCAPE ENGINEER for the CALIF. H'WAY DEPT., is the owner of a LILTING GROUP OF TONSILS. We had first hand information ON HIS "TRIUMPH."

* * * *

● *ORVILLE SPICER, pres. of the BARTLETT TREE EX. CO. gave us the first hand dope on Bowers. ORVILLE, his wife, ESTELLE, (whom he is BRINGING TO CLEVELAND for the 23rd N S T C this month) and his family, MARY ELIZABETH and EDDIE, stopped OFF IN CLEVELAND for a few hours on THEIR RETURN FROM a vacation in THE WEST. They attended the 14th WESTERN CHAPTER meeting in BERKELEY and were PLEASED TO LEARN that DANA WILL be among those PRESENT IN CLEVELAND come the eighteenth.*

* * * *

● LIME HOWE is working on another EDITION OF HIS BOOK. It is being USED BY CLASSES at the UNIVS. OF MARYLAND AND FLORIDA. The new one is DUE THIS FALL.

* * * *

● *For THE SECOND straight year HAROLD NEWINS is going to MISS A SHADE TREE CONFERENCE. He tells us he is going to VACATION IN CALIFORNIA. That ought to BE PLEASANT HAROLD after that FLORIDA HEAT AND SNOW.*

* * * *

● It was a PROFOUND SHOCK to learn of the death of DR. J. S. HOUSER in June. We had been with him a short time before at a Conference committee meeting and he was enthusiastically looking forward to the Educational exhibits, of which he was chairman. The Conference has lost a VALUED WORKER and we have all LOST A GOOD FRIEND.

* * * *

● *A VISITOR the other day from SHELBY, N. C. was none other than our friend ALEX McRAE, "the line clearance man" (CAROLINA TREE SERVICE CO.). Alex was on a HUNTING TRIP—hunting LOTS OF 2, 4 D and he GOT IT.*

* * * *

● A GOOD TREE MAN is BADLY NEEDED by THE KANE TREE SERVICE (H. H. Kane prop.) at SARATOGA SPRINGS, N. Y. Good pay is assured SO DROP THE PROP a note.

* * * *

● *PAPA AND MAMA IRISH celebrated their 26th WEDDING ANNIVERSARY and SON EDDIE TOOK UPON himself a wife—nee, MARTHA HORSTMAN—and all on the SAME DAY, June 21st. CONGRATULATIONS to both SWELL COUPLES for many MORE ANNIVERSARIES.*

* * * *

● The CITY OF YOUNGSTOWN is aroused over the threat of DUTCH ELM DISEASE. With PHILIP H. SCHAFF a public minded and tree minded citizen and AL DAVIES, Supt. of MILL CREEK PARK carrying the ball, a COMMITTEE OF PROMINENT CITIZENS has been formed to carry the FIGHT TO THE BEETLE.

* * * *

● *DON'T FORGET to send that CHANGE OF ADDRESS. It will ASSURE PROMPT receipt of TREES.*

* * * *

● KENNETH FUNK of the FUNK TREE SERVICE, Jeromesville, Ohio, has a fully equipped LINE CLEARANCE OUTFIT for sale. Also a 200 GALLON MYERS High Pressure Sprayer. The SPRAYER WAS new this spring. LOOKS LIKE A BUY.

* * * *

● *Make those HOTEL RESERVATIONS right now for the NATIONAL SHADE TREE CONFERENCE, CLEVELAND, Aug. 18 to 22.*

* * * *

● ED MENNINGER, "the flowering tree man" of Stuart, Fla. TELLS US of a disease that is raising hob with the Casuarina. HAROLD NEWINS says it is apparently the CALITOCYDE—similar to ARMILLARIA in other PARTS OF THE COUNTRY.

* * * *

● *Wm. A. CARROLL, former general foreman of the SACRAMENTO PARKS DEPT. has been appointed SUPERINTENDENT OF PARKS to fill the vacancy caused by the death of FRED EVANS.*

* * * *

● Had some GOOD SUGGESTIONS for the NATIONAL SHADE TREE CONFERENCE from WILBUR SEUBERT of Sioux City, Iowa. The one on a DIRECTORY of where each delegate is STAYING will be adopted. THANKS.

* * * *

● *The INCREASINGLY POPULAR CITY FORESTERS' section of the N. S. T. C. will be master minded this year by JACK KENEALY. Let's have a BIG TURNOUT.*

* * * *

● And now from ED CONNELL comes a challenge for the "CAPE COD YANKEES" to joust at B. B. with the SHIELD WEBFOOTS. The ballfield at the DEMONSTRATION SITE is reserved so you HORSEHIDERS can ramble if THOU SO DESIREST.

* * * *

● *A new edition of the "TREE EXPERTS MANUAL" is in the mill, reports DICK FENSKA, the proud papa. We'll be GLAD TO SEE IT.*

* * * *

● A NEW SUBSCRIBER from SANTA FE, N. MEX., JOE VINCENT put in an S. O. S. for a FLOCK OF BACK ISSUES to take on a mountain vacation trip. Ought to be having a great time about now with all those NICE TREES.

* * * *

● *NORMIE ARMSTRONG, our private heckler, thinks A. W. IS NUTS for wishing to see STREETS LINED WITH globe head elms (story last issue). NORMIE calls the elm—ULMUS DEFUNCTUS—might have a good POINT THERE CHUM.*

* * * *

● From the OTHER SIDE OF THE WORLD comes news of the formation of the "ARBORICULTURAL SOCIETY OF SOUTH AFRICA." At present they have an INTERESTING BI-MONTHLY publication of eight pages. The HOME OFFICE is in JOHANNESBURG.

* * * *

● *Also from "DOWN UNDER" we had a most interesting visit from MR. AND MRS. LIN PRYOR of CANBERRA, AUSTRALIA. LIN is with the DEPARTMENT OF THE INTERIOR and is making a tour to STUDY CITY STREET TREE work and* arboriculture in general in the U. S. *CANADA, ENGLAND and SOUTH AFRICA. HURRY BACK FOLKS.*

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Vol. 7 Bi-Monthly No. 5

Subscription Price $2.00 Per Year (Foreign $2.50) 35 Cents Per Copy
Box 5607, Cleveland, Ohio

The Editors of TREES invite discussions, comments and all types of literary materials pertaining to trees and tree preservation from any person engaged either in the scientific advancement or commercial development of the field.

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● LOUIS BROMFIELD has placed his famed MALABAR FARM at the disposal of the OHIO NURSERYMAN'S ASSOCIATION for one day of its two day AUGUST MEETING. The following day, Aug. 30th will be SPENT AT the EXPERIMENT STATION IN WOOSTER. Headquarters will be the MANSFIELD LELAND HOTEL, Mansfield, O.

* * * *

● *JOHN SIEBENTHALER the RICH nurseryman FROM DAYTON is going to LOAF A WEEK or so in Canada and WILL PROBABLY come home with SOME SWELL STORIES about IMPOSSIBLE FISH.*

* * * *

● *GORDON Z. RAYNER, park super of SHEBOYGAN, WIS., writing on the bird nuisance SITCHEAYSHUN says "people are willing to sacrifice beautiful trees in order to be relieved of the bird problem." CAN'T SAY AS I BLAME THEM, but we should work on the subject, it's SQUARELY UP TO ARBORISTS. On the CLEVELAND PUBLIC SQUARE last summer we had splendid results with DESTRUXOL'S "BIRDSOFF"—with pigeons. Also, they say this SUPERSONIC TREATMENT HAS MERIT. Cleveland's Park Commissioner, SAMUEL NEWMAN, is TRYING IT OUT THIS SUMMER.*

* * * *

● *CHARLIE CRAWFORD checks in with a note TO THE EFFECT that the nice ZELKOVA SERRATA in his yard came through the TWO NASTY SLEET STORMS in TOLEDO LAST WINTER without RUFFLING A TWIG. A worthwhile tree.*

* * * *

● The WIND AND SNOW storm that HIT CLEVELAND, MARCH 25th, was a dinger. The wind started at 1:00 A. M. DOING 60 M.P.H. and at midnight when we FINALLY KNOCKED OFF, it was still roaring at 60 m.p.h. Snow—oh, SHADES OF SANTA MONICA, how I could have used some of that SUNSHINE AND BALMY BREEZES.

Cleveland Welcomes You To The National Shade Tree Conference

July-August, 1947 **Journal of the National Arborist Association** Vol. 7—No. 5

EDWARD H. SCANLON, Editor
Box 5607, Cleveland, Ohio
Phone ORchard 0341

"No place is complete without trees. A home without trees is charmless; a road without trees is shadeless; a park without trees is purposeless; *a country without trees is hopeless*"

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Landscape Architect, Los Angeles, Calif.

EMANUEL FRITZ
Associate Professor of Forestry
University of Califoria, Berkeley, Calif.

Out on a Limb

RESTORE DUTCH ELM DISEASE FUNDS

An unfortunate urge on the part of the Federal Congress for economy has resulted in the elimination of funds for the fight against Dutch Elm disease. The particular funds affected were those most badly needed, for scouting and laboratory work. A determined effort, not only by arborists, but by the entire peoples of the affected areas, should be made to have this shortsighted policy remedied.

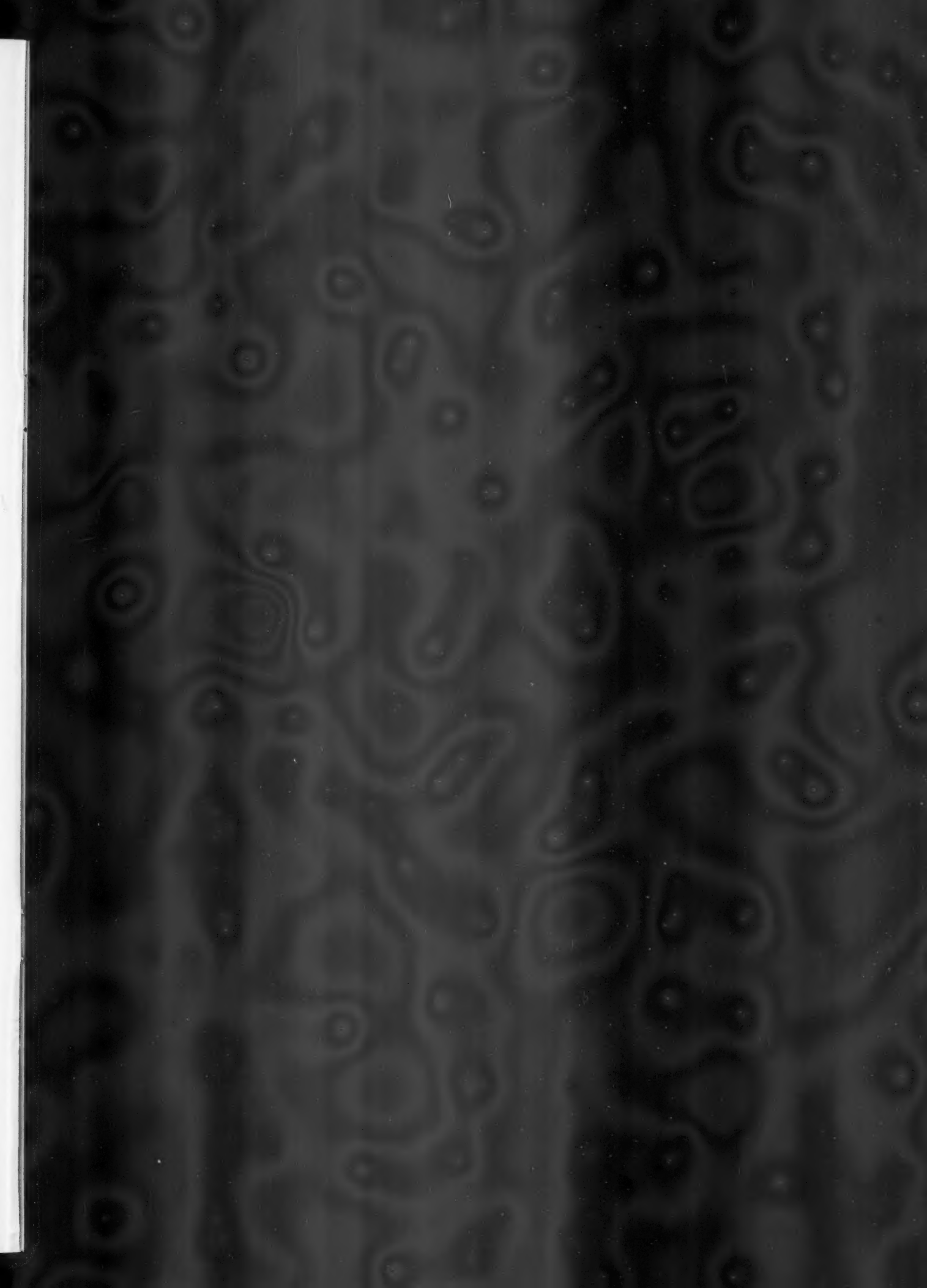
It is true the Congress is beset by many groups, organizations, etc., for the allocations of fabulous sums for this and that, and they must cut here and stop there, but it would seem, to a lay observer, viewing the activities of Congress through the eyes of the daily press that some rather questionable dispensations of funds are being made.

A recent newspaper story tells of the twenty billions of American dollars that have gone, presumably as gifts, no one ever bothers to pay on the mortgages owed to our Uncle, to foreign countries. Again speaking as a 'man in the street,' what do we owe those people? They have land, forests, rivers, lakes and sunshine just as we, and if they are too stupid to cultivate and use their resources why should the industry and savings and sweat of our people be poured into the maintennance of these medieval monstrosities. Those people maintain silly kings in pomp and splendor, they revel in the inane poison of military and naval extravaganzas, they pour out their meagre earnings to build magnificent museums, churches and other such institutions, and with all their culture they are continually at war and always starving to death. Obviously something is wrong, and has been for centuries, but let them figure it out.

It would seem that if there is any intelligence in Congress, and there is, it would be expended on our own problems. The amount involved in the Dutch Elm disease campaign is small. True, many small amounts add up to a sizable sum and all cannot be passed, but the American Elm is an integral part of the culture and welfare of every American city and community. Its loss would be more catastrophic and far reaching than to incur the enmity of some decadent European country.

These funds should be restored and every worthwhile American should participate in the fight. We don't want another Chestnut Blight—what happened to the chestnut was unavoidable, no control was or is known, but the same is not true of the Dutch Elm diseae. Effective control measures are known, so if we lose the American elm through a policy of hindsight the stigma will rest on the heads of the present Congress.

Write to Senator Arthur Capper, Chairman of the Senate Agricultural Committee, your two United States Senators and your own Congressmen—urge or demand the restoration of the Dutch Elm disease appropriation—but don't wait, write immediately.



BUILD A LIBRARY

With the gathering of dollars not quite the problem it was in the 1930's many arborists have wisely taken advantage of present conditions to commence building, or add to already begun, libraries.

Ignoramuses may berate "book larnin'" but the arborist or horticulturist in any field who tries to get along without a good working library of reference books is hurting himself and his clients, and usually, our friends, the trees. There is entirely too much to know about the fascinating science of arboriculture for any one man, or a dozen, to be able to know it all. The best informed people we know own the finest libraries.

You would no more attempt to saw off a limb with a file than you would attempt to walk across the ocean. Saws and axes are the tools of the hands—*books are the tools of the brain.*

It is not necessary that you gather first editions or volumes of some of the very early works like Evelyns Silva or Forsythe and others, but it is stimulating and satisfying and many arborists are doing just this today. However, there are a number of contemporary publications that will afford the arborist a working knowledge of the many sides of his complicated profession. There are a number of dendrologies, books on pathology, entomology, soils, fertilizers, sprays, and other subjects that will make the arborist fluent with the problems of his craft. Unfortunately we do not have a specialized series of basic manuals but this may come. Fortunately we have the nearly 5,000 pages of eighteen published volumes of the National Shade Tree Conference that should be a part of every library—not alone that of the arborist.

Books gathered today will reap a harvest of pleasure, knowledge and, if you insist, dollars, in the years ahead. A good working library is the hallmark of integrity and the will to serve better.

Helicopter Combats Frost

The first successful use of a helicopter to combat frost has just been announced.

It was an all-night operation, covering 80 acres of apple trees on the orchard of S. A. Heisey at Upton, Pa.

For several nights prior there had been occasional frosts. Smudge pots and conventional aircraft flying overhead were used to alleviate the damage, but without much success. Weather forecasters predicted a possible low of 24° for the coming night.

John C. Good, area manager of the Bartlett Tree Expert Company, was called in. Mr. Good, who also manages the Helicopter Spraying and Dusting Service of Chambersburg, proposed using a helicopter to create a turbulence and force warm air above the orchard downward. A single helicopter forces approximately 1,500 cubic feet of air downward every minute with its large rotor blades.

Mr. Heisey agreed. A Sikorsky S-51 helicopter was promptly flown in from its base at Camden, N. J. Since civilian helicopters were not licensed to fly at night, Mr. Good had to obtain special permission from the Civil Aeronautics Administration and the Pennsylvania Bureau of Aeronautics.

A base was set up on a small knoll adjoining the Heisey orchard. Headlights from parked cars were used to light up the knoll for takeoffs and landings. Truck flares were set up at the four corners of the orchard. Several bonfires were lit in the center of the orchard to help serve as guideposts.

Before dark a test flight was made over the orchard to plot low areas where the temperature might become critical.

By midnight the temperature began to fall rapidly. The sky was crystal clear. The air was calm. Conditions for a killing frost were ideal. The 2 a. m. reading showed the temperature beginning to drop rapidly. By 2:30 a. m., it had plummeted to 26° F.

Archie Lush, the pilot, took off with Mr. Good. Flying at 30 miles per hour, the helicopter climbed until it hit a warm strata of air—temperature 42°—at about 150 feet above the trees. The 'copter kept at this level for 15 minutes.

Scattered through the orchard were thermometers, which were read before, during and after each succeeding flight. The first flight pushed the temperature up but 3° at a high point and 1° to the low point of the orchard.

Mr. Good decided to fly lower and slower on the second flight. The helicopter took off again, flying from 30 to 50 feet above the trees and hovering from 0 to 8 m.p.h. for 45 minutes. The flight concentrated over the low areas of the orchard with occasional passes over the other areas.

The turbulance created by the rotor blades blew through the trees like a strong wind. During the flight the temperature in the most critical area rose from 26° to 32° and on a ridge skirting one side of the orchard it jumped from 29° to 38.°

During the 30 minutes it took to refuel, the mercury again fell, to 27° in one spot and 28° in another. On the third flight, 20 minutes long, the moon had risen and the visibility was good. This flight sent the reading from 27° to 35° and 28° to 31°. A fourth flight was made just before dawn.

Overall flying time during the night was 1 hour, 35 minutes. The effect of the helicopter combatting frost was visibly demonstrated during the last flight. A white coatting of frost atop a parked auto disappeared as the plane flew overhead.

J. Henry Heisey, son of the orchardist, logged the statistical data. "If we had had the helicopter in operation over the orchard the night before, we wouldn't have lost an apple," he remarked.

Wet Weather Favors Leaf Blight of Maples

The "scorched leaf" type of injury observed on maple foliage this year is due to injury by a parasite belonging to the anthracnose group of fungi. The hard maple is especially susceptible, points out H. A. Runnels of the Department of Botany and Plant Pathology at the Ohio Agricultural Experiment Station.

The affected areas are light brown, rather indefinite in outline, and variable in size and shape. Due to the overlapping of several lesions, the leaves often take on a scorched appearance and may start to drop following a severe attack.

This disease is apt to become serious during a spring marked by frequent and extended rain periods. Ideal conditions for dissemination of and infection by the fungus have prevailed during the past month.

A three-application spray schedule, with either a 2-2-50 Bordeaux mixture or a fixed copper, begun when the leaves are one-fourth out, repeated after 10 days and again when foliage is fully expanded, is some times advised for valuable ornamental maples.

Western Chapter At Santa Barbara

After a very instructive meeting attended by 125 delegates from all parts of the west, the members of the Western Chapter, National Shade Tree Conference, considered invitations for the 1948 meeting from Salt Lake City, Long Beach and Santa Barbara. The vote was for Santa Barbara.

The meeting ran from June 19-21 at the University of California, Berkeley and was highlighted, according to Dr. Willis W. Wagener, president, by two panel discussions. Shade Trees in cities was the topic of the session monitored by the Association of Landscape Architects, while the ever popular Shade Tree Clinic could have gone another hour or two.

Malcolm MacKenzie, Superintendent of Parks at Santa Barbara was elected president, Horace Bosworth, California Division of Highways, vice-president, and Elmer Lee, reelected Secretary.

Out of staters welcomed were Orville Spicer, president of the F. A. Bartlett Tree Expert Co., Stamford, Conn.; Director Milligan of the University of Washington Arboretum, Seattle, and Rufus Johnson, Tree Warden of Salt Lake City, Utah.

Cleveland Mecca For Arborists

National Shade Tree Conference Opens August 18th, Runs to 22nd

Few shade tree owners in America will know of the assemblage that will convene in Cleveland, Ohio, August 18, to discuss scientific and every day problems that affect the health and beauty of his prized oaks, maples, elms or other trees.

This is unfortunate, but some day the National Shade Tree Conference may become affluent enough to enable it to broadcast the story of its other riches. The conference is rich in accomplishment, but poor in recognition—not only by the shade tree owner, but it is little known or understood by many in horticultural or forestry pursuits. That is their loss and only they can rectify it by becoming acquainted with the accomplishments of this twenty-three-year-old organization.

It had its beginning in Stamford, Connecticut, in 1924 and the prime reason for the calling of this meeting was the feeling of outstanding arborists that an effort must be made to interest men of science in the everyday problems of arborists. Too, many charlatans were running wild throughout the country, ruining some of the finest shade trees and casting an aura of suspicion over those honestly engaged in this so necessary service to American shade tree owners. The first meeting was a success. From an humble beginning with about fifteen members it has grown to represent a highly respected industry doing fifty millions of dollars of business a year and having a membership roster of over 900 members, spread from coast to coast.

There have been many reforms in the profession of arboriculture in these twenty-three years; there have been many scientific advances in the manner of caring for diseased and insect ridden trees; it has become increasingly more difficult for the unscrupulous to ply their trade —all of this has resulted in a higher type of service to the public based on scientific research in combatting serious disorders that have affected the country's shade trees.

If you are an arborist and are not a member of the National Shade Tree Conference you can compare yourself to

Program, 23rd National

ALL MEETINGS IN BALL ROOM, MEZZANINE, HOTEL CLEVELAND UNLESS OTHERWISE MENTIONED.

Time—Eastern Standard Time.

Sunday, August 17

P. M.

2:30 — Meeting of the Executive Committee of the National Shade Tree Conference, East Room.

Monday, August 18

A. M.

9:30 — Registration. Mezzanine.

Interesting trips in vicinity of Cleveland.
(Notify the Convention Manager, not later than August 12, the trips you would like to take).

Holden Arboretum — City Parks
Metropolitan Parks — Davey Tree Expert Co., Kent, Ohio.
Nurseries, Painesville, Ohio.

P. M.

1:30 — Registration. Mezzanine.

Visit the Commercial and Educational Exhibits.
Interesting trips in vicinity of Cleveland.
Closed meeting of the National Arborists Association. Empire Room.

EVENING

6:30 — Dinner for the Commercial Exhibitors.
8:15 — Open Meeting.

Plant Materials Through the Season at The Arnold Arboretum and in our National Parks. Illustrated in color.
Donald Wyman, Horticulturist, The Arnold Arboretum, Jamaica Plain, Mass.

Tuesday, August 19

A. M.

9:30 — Registration. Mezzanine.

Twenty-Third National Shade Tree Conference Convention Called to Order by Pres. Chas. F. Irish.

Address of Welcome
Hon. Thomas A. Burke, Mayor of Cleveland.

Some Aspects of Tree Physiology
Freeman S. Howlett, Chairman, Dept. of Horticulture, Ohio State University, Columbus, Ohio.

Soil Aeration—Its Importance to Plant Growth and Disease Control
Lee M. Hutchins, Head Pathologist, Div. Forest Pathology, Bureau Plant Industry, U.S.D.A., Beltsville, Md.

P. M.

1:30 — Registration. Mezzanine.

Program Sponsored by the National Arborists Association.
Pres. Ross Farrens, Farrens Tree Surgeons, 1008 Lynch Bldg., Jacksonville, Florida, presiding.

Shade Tree Evaluation Formulas and Their Use
Norman Armstrong, 517 Peoples Bank Bldg., White Plains, N. Y.

Shade Tree Laws
Paul E. Tilford, Secretary, National Arborists Association, Wooster, Ohio.

Public Utilities Attitude Toward Tree Preservation
H. O. Drennan, Carolina Power & Light Co., Raleigh, N. Carolina.

Problems of the Public Utility Forester
Karl Kuemmerling, Forester to Public Utilities, Canton, Ohio.

EVENING

An Open Evening—No definite program scheduled.
A chance for informal discussion.
American League Ball Game—Lake Front Stadium, Washington Senators vs. Cleveland Indians.

Wednesday, August 20

A. M.

9:30 — Registration. Mezzanine.

Business Session. Open to all members. Pres. Chas. F. Irish, presiding.
Adaptability and Source of Supply of Some of the Newer and More Unusual Trees. (Illustrated)—Panel Discussion.
Discussion Leader—Henry Skinner, Curator, The Morris Arboretum, Philadelphia, Pa.
Panel Members—Noel Wysong, Cook County Forest Preserve District River Forest, Illinois.
L. C. Chadwick, Dept. Horticulture, Ohio State University, Columbus, O.

"Welcome To Cleveland" . . . .

Shade Tree Conference

P. M.

1:30 — Field Demonstrations of Tools and Equipment. Edgewater Park.

EVENING

7:00 — National Arborists Association. Dinner and Business Meeting. Empire Room.

8:00 — Meeting of City Foresters, Park Superintendents and Others Interested in Public Area Tree Management Problems. Ball Room.
Discussion Leader: J. C. Kenealy, Lower Merion Twp. Shade Tree Commissioner, Ardmore, Pa.

Thursday, August 21

A. M.

9:30 — Session Chairman: Curtis May, Vice-President, National Shade Tree Conference.

Standards of Policy and Practice in Municipal Arboriculture.
Carl Fenner, Ass't City Forester, Lansing, Michigan.

Recent Developments in Insecticides and Fungicides.
Present Status of Velsicol 1068 (Chlorodane) and Other Recently Developed Insecticides.
John T. Creighton, Department of Entomology, University of Florida, Gainesville, Fla.

Fungicides.
J. C. Carter, Associate Botanist, Illinois Natural History Survey, Urbana, Illinois.

P. M.

1:30 — Session Chairman: Curtis May, Vice-President, National Shade Tree Conference.

D.D.T. — Panel Discussion.
Discussion Leader—George S. Langford, Specialist in Insect Control, University of Maryland, College Park, Md.
A Critical Review of D.D.T.—George S. Langford, University of Maryland, College Park, Md.

Operator Experiences:
E. W. Higgins, Frost & Higgins Co., Arlington, Mass.
B. F. Lawrence, Lawrence Tree Expert Co., Greenfield, Mass.
Albert W. Meserve, Albert W. Meserve Co., Danbury, Conn.
D. E. Parker, Senior Entomologist, Bureau of Entomology and Plant Plant Quarantine, U.S.D.A., Beltsville, Md.

Progress in Chemotherapy of Dutch Elm Disease.
Albert E. Dimond, Dept. Plant Pathology, Conn. Agr. Exp. Stat., New Haven, Conn.

Correlation of Street Lighting and Street Tree Management.
The Long Range Picture of the Possibilities of Eliminating Conflicts by In-Scale Planting.
Edward H. Scanlon, Commissioner of Shade Trees, Cleveland, Ohio.
Effect of Present Conflict on Light Output.
Kirk M. Reid, General Electric Co., Cleveland, Ohio.

EVENING

7:00 — Annual Banquet, Ball Room. A Gala Affair.

Friday, August 22

A. M.

9:30 — Pres. Chas. F. Irish, Presiding.

Business Session—Board of Governors and Members.
Roll Call of Members of Board of Governors.
Report of Convention Committees.
Selection of 1949 Convention City.
Old Business.
New Business.

Mist Blower Sprayers—Panel Discussion.
Discussion Leader—George W. Harding, Chief, Horticulture and Maintenance Div., National Capitol Parks, Washington, D. C.

Mechanics, Operations and Adaptability.
S. F. Potts, Entomologist, Bureau of Entomology and Plant Quarantine, New Haven, Conn.

Operator Experiences:
George W. Harding, National Capitol Parks, Washington, D. C.
Edward H. Scanlon, Commissioner of Shade Trees, Cleveland, Ohio.
Oscar Warner, Landscape Forester, Waterbury, Conn.
Wilfrid Wheeler, Jr., Bartlett Tree Expert Co., Cambridge, Mass.

12:30 — Adjournment.

a medical doctor who is not a member of the American Medical Association. You would hesitate before you would call such a person in to care for your family or yourself. A doctor must keep up with the latest developments of science. Science is as much a part of your profession as it is of the medical profession, how then can you serve your clients to the best if you do not keep abreast of advancing science.

You need not be a member of the conference to attend the 23rd annual meeting in Cleveland. You need not be an arborist, but if you use or grow or work with trees in any capacity you should be there. And, sincerely, you should be a member to help in the development of this great service to the public—and the arborist.

One of the latest developments in insect control, "mist" spraying, will be exhaustively explored in a panel discussion led by several of the country's outstanding authorities on the subject.

The following firms will exhibit and demonstrate materials, tools and eqiupment at the National Shade Tree Conference in Cleveland:

American Soil Sponge Selling Co.
Feller-Jones Mist Sprayer Co.
E. F. Donley's Sons, Inc.
F. H. Woodruff & Sons, Inc.
Mall Tool Company
The Buda Company
Friend Manufacturing Co.
Geigy Co., Inc.
Homelite Corporation
General Chemical Co.
J. G. Butts Mfg. Co.
Lombard Governor Corp.
Ariens Company
Farm Supplies & Power Equip. Co.
Williams & Harvey Nurseries Co.
Ohio Toro Company
E. F. Daim Supply Co.
B. G. Pratt Company
Hardie Manufacturing Co.
Arborist Supply Company
Fitzhenry-Guptill Company
Harold A. Smith, Precision Chain Saw
Superior Manufacturing Company
Buckingham Mfg Co., Inc.
Ra-Pid-Gro Corporation
Electra Protection Company
Karl Kuemmerling, Inc.
The F. E. Myers & Bro. Co.
Sherwin-Williams Company
Fruit Growers of Chester County, Inc.
Lawrence Aero-Mist Sprayer Co.
Bartlett Manufacturing Co.
John Bean Mfg. Company
Little Giant Tree Feller Corp.
A. M. Leonard & Son
H. K. Porter, Inc.
Schramm, Inc.

Tract...

Particle or Droplet Size of Insecticides and its Relation to Application, Distribution and Deposit

By S. F. Potts,
Bureau of Entomology and Plant Quarantine, U.S.D.A., New Haven, Conn.

Recent developments in the application of insecticides in the form of smokes, liquefied-gas aerosols, and finely atomized sprays, with equipment operated from the ground and from aircraft, have attracted attention to the significance of particle or droplet size. The purpose of this article is to present the highlights of the author's experiments on this subject, with the hope that the information may be of assistance to other workers in the same field of research.

Particle size is an important factor in determining deposit, distribution, and effectiveness of dusts and concentrated sprays. Under field conditions extremely minute individual particles of finely ground dusts, insecticidal smokes, finely atomized aerosols, and concentrated sprays are not deposited on the surface of plants, insects, and other objects. Apprently such objects are surrounded by a "film, or field of resistance," the nature of which is not known and through which minute particles cannot penetrate. An electric field around such objects may possibly cause a repulsion of minute particles. Microclimatic conditions caused by differences in temperature, humidity, and weight of air near such objects produce air currents which carry away minute particles. Deposit is particularly light on warm, sunny days, and often there is a difference in temperature of as much as 10 Fahrenheit degrees between the sunny and shady sides of a leaf. Less deposit has been noted on the underside of cup-shaped or cringed leaves than on the upper surface.

Larger individual particles, whether dry or liquid, as well as groups or agglomerates of small dust particles, are heavy enough to penetrate the film of resistance and make contact with the surface of leaves, insects, and other objects.

Dusts.—A series of studies conducted from 1926 to 1935 brought out the following conclusions concerning dusts:

Small individual dust particles do not give a good deposit. Dust clouds consist of mixtures of individual particles and groups, which may be composed of 25 to 300 individual particles (Potts, 1940). Such groups of dust particles may settle on a surface, but do not adhere well. After dust is expelled from a blower, these groups of particles do not tend to break up nor do the individual dust particles in the cloud tend to coalesce.

Dust particles of heavy substances, such as barite, deposit somewhat better than do particles of light materials, such as derris, although, from the standpoint of deposit, the weight of the individual particles of a material is not so important as the presence of agglomerates in the dust cloud.

Proportionately more dust is deposited from a cloud of heavy dust expelled from a blower at a low velocity than from a cloud of light dust expelled at a high velocity and with a large volume of air.

Dust applied at a high velocity penetrates the resistant film around objects near the blower and deposits on them; however, at several feet from the blower the effect of high initial velocity is lost. This explains, in part, why ground equipment may never be very effective in dusting trees.

The fineness of a dust, as indicated on the package or container, is not a criterion of its depositing qualities. The following insecticides are listed in descending order of the proportion of dust deposited on the foliage: Sulfur, lead arsenate, derris and cube, pyrethrum, and cryolite. Sulfur particles are fairly large, as compared with those of the other materials. Lead arsenate particles are heavy and very fine (mostly less than 2 microns in diameter), but when applied this material forms groups of particles. Derris, cube, and pyrethrum dust particles are light and coarse. Cryolite dust has a greater tendency than most materials have to break up into individual particles upon application. It gives a lighter deposit than lead arsenate, but the deposit can be considerably increased by adding to the dust 10 or more parts of pyrophyllite to each part of cryolite.

Dust swaths applied by aircraft are often several hundred feet wide, but their effective width is seldom more than 40 to 60 feet, the effectiveness being confined mostly to that part of the swath where a deposit of agglomerates, or particle groups, exists.

The failure to control insects with dusts is due to light deposit and poor adherence, rather than to small quantity of material or small number of particles applied. Even when a dust having a particle diameter of 0.5 to 2 microns is applied at the rate of 1 pound per acre, although thousands of particles per square millimeter of surface might be available, insect control might not be obtained.

Air-mixed, Oil-coated Dust.—When a cloud of finely atomized dust is mixed with a cloud of finely atomized oil, in the absence of pressure or vacuum, there is little tendency for the oil particles to coalesce with the dust particles and only a small portion of the dust particles are coated with oil. It seems possible that at least the smaller particles may actually repel each other. On the other hand, when an oil or other liquid is atomized by the force of a stream of compressed air (15 pounds' pressure or more) which contains the dust, a fairly good coating is obtained. A considerable amount of the dust can be coated if the liquid is finely atomized with high-velocity (150 to 300 m.p.h.) air from a blower. The coated particles coalesce into groups and adhere to foliage better than do ordinary uncoated dust particles.

Concentrated Spray.—The failure of dusts to deposit and adhere satisfactorily on foliage has led to the development of highly concentrated insecticidal sprays and the application of these concentrates as finely atomized mists. This method permits coverage with a lower gallonage per acre. Although fine atomization is necessary to obtain adequate distribution with low rates of application, the droplets must be large enough to give a satisfactory deposit on foliage and insects. There is little deposit of droplets less than 20 microns in diameter; in feet, very few are deposited unless their diameter exceeds 25 microns. A remarkable difference is noted in the intial deposit of finely atomized sprays, as compared with dusts, the deposit of the former being several times as great as that of the latter. The loss of deposit caused by rain and wind makes the difference between dusts and atomized sprays even more pronounced in favor of the sprays.

Factors Affecting Particle or Droplet Size.—The number of droplets of given size that would be deposited per square millimeter and per square inch (645 square millimeters) by the distribution of 1 gallon of spray (3,785,000,000,000,000 cubic microns) uniformly over a surface of 1 acre are shown in table 1. A droplet diameter of 40 to 70 microns would result in a deposit of 17,931 to 3,354 droplets per square inch, and a diameter of 80 to 100 *microns*, a deposit of 2,157 to 1,164 droplets per square inch. The writer believes that for the

Spraying Yale Bowl at New Haven, Conn., with a Bean Mist Duster

application of concentrated sprays with ground equipment the optimum diameter of droplets range from about 30 to 80 microns and for aerial application from about 70 to 100 microns, both depending on the density and type of the insecticide, the volatility of the carrier, the plant growth, the kind of insect, the type of distributing device, and the atmospheric conditions. Under certain circumstances, which are discussed later in this paper, the droplet size for aerial application should be considerably greater. It will be seen in table 1 that a slight change in diameter will change the volume and number of droplets materially. For example, when the diameter is 20 microns, there are about 8 times as many droplets as at 40 microns diameter; nearly 16 times as many at 40 microns diameter as at 100 microns; and about 125 times as many at 100 microns diameter as at 500 microns. At 50 microns diameter there are about as many droplets in 1 gallon of mixture as in 143 gallons when the diameter is 260 microns. In any spray pattern there are proportionately a great many more small droplets than large ones, but the greater volume of spray is in the larger droplets.

When slowly volatile or non-volatile oils are finely atomized, the droplets on an object tend to coalesce to form a continuous film over the exposed surface. When the oil is spread evenly, approximately 1 gallon per acre of leaf surface is ordinarily required to form a continuous film. Excepting sweetened and poisoned sprays or foods, better control of spider mites and such insects as thrips, aphids, and snout beetles is obtained with droplets of smaller size than are needed for large insects and gross feeders. Many first-instar aphids are large enough to cover an area of only 0.6 square millimeter. A white pine weevil adult makes an 0.8 millimeter hole in the bark in the process of feeding, and 1,000 or more droplets of lead arsenate concentrate are required per square inch of bark in order to effect good control, because female weevils must be killed quickly before they lay eggs. For many gross feeders a much smaller number of droplets, having a diameter of 150 to 300 microns, would be adequate.

Wetting agents in sprays containing water reduce the droplet size 30 to 50 per cent. Droplet is an important factor to be considered in studies of foliage injury. The danger of injury is lessened with a decrease in particle droplet size and in the quantity of phytotoxic ingredients applied per acre. If the wetting agent is phytotoxic, it is better to use as little of it as possible and to reduce the droplet size by mechanical means.

The area of foliage per acre to be covered governs to a considerable extent the *gallonage* of spray required. The amount, however, is also dependent on the degree of atomization produced by the distributing apparatus. Consequently, the finer the atomization the less spray will be required to cover a given area of foliage, except that if the atomization is too fine there will be very little deposit. With less gallonage and finer atomization, it is necessary to increase the concentration of the spray mixture to obtain adequate dosage per acre.

In concentrates containing water the droplets tend to flatten out when they strike the surface of a leaf. The increase in diameter caused by spreading ranges from very little to approximately 300 per cent, depending on the size of the droplet, the type and amount of wetting agent used, and the extent to which the particles dry out before reaching the foliage. Oil droplets may increase to from 10 to 15 times their original diameters, depending on the type of leaf surface, the droplet size, and the viscosity of the oil. Spreading is even greater on glass plates than on leaves.

Application of Sprays with ground equipment.—Other things being equal, the distance over which blowers can drive a cloud of finely atomized spray mist is directly related to particle size. In 1940, at Gulfport, Miss., a 5-horsepower blower with atomizing nozzles set in the dust-outlet tube was used to apply a fine spray of droplets ranging from 60 to 80 microns in diameter. The finer spray was driven a horizontal distance of about 150 feet, whereas the coarser spray could be driven only 20 to 40 feet. The finer spray could have been driven vertically a distance of 40

(Continued on Page 18)

TABLE 1.—Size and number of particles deposited per unit area by distributing 1 gallon of liquid uniformly over a surface of 1 acre.

Actual Diam. (Microns)	Volume (Cubic Microns)1	Number of Droplets per Sq. Mm.	Number of Droplets Sq. Inch	Actual Diam. (Microns)	Volume Cubic Microns)1	Number of Droplets per Sq. Mm.	Number of Droplets Sq. Inch
1	0.52	1,780,125		100	525,000	1.78	1,164
2	4.2	222,516		110	699,000	1.33	856
3	14.18	65,930		120	907,000	1.03	664
4	33.6	27,814		130	1,153,000	.81	530
5	65.6	14,242		140	1,440,000	.65	425
6	113.4	8,241		150	1,771,000	0.53	347
7	180	5,197		160	2,150,000	.43	277
8	269	3,476		170	2,579,000	.36	232
10	525	1,780	1,148,100	180	3,061,000	.30	194
12	907	1,030		190	3,600,000	.26	168
13.5	1,289	725		200	4,200,000	.22	142
15	1,772	527		220	5,590,000	.17	111
17.5	2,814	332		240	7,257,000	.12	78
18	3,062	305		260	9,227,000	.10	65
20	4,200	222	143,190	280	11,528,000	.08	52
24	7,257	129		300	14,175,000	.066	43
25	7,442	125	80,625	400		.028	18
30	14,175	66	42,570	500		.014	9
35	22,507	41.5	26,767	1,000		.0018	1.1
40	33,600	27.8	17,931				
45	47,838	19.5	12,577				
50	65,520	14.3	9,224				
55	87,343	10.6	6,837				
60	113,400	8.2	5,289				
70	180,007	5.2	3,354				
80	268,800	3.5	2,157				
90	382,725	2.44	1,574				

(1) Obtained by multiplying the cube of the radius by 4.2.
(2) 1 gallon of concentrate spread over 1 acre gives 934,568 cubic microns (M3) of liquid per square millimeter.

The Arborists Clinic

QUESTION: Has anyone any ideas on building a home made Tree Mover?
S. K., INDIANA.

ANSWER: Ideas on building home made tree movers seem to be as numerous with arborists and generally about as useful as new deal schemes. After some 32 years of using movers manufactured by others and building home made tree mover of my own, I suggest that if S. K. has plenty of time and money he can have a lot of fun making a mover and working for years to correct its weaknesses. Practically all the patents on movers on record in the patent office and they are numerous, were taken out not by manufacturers but by practical operating tree men who felt they needed a better mover than they had been able to purchase. It is my belief that the vast majority of these men, myself included, would have been financially better off if they had used the rigs available. However, the only way we develop a better tool, be it a tree mover or any other tool, is to try and the satisfaction which comes with a small degree of success may be worth all the hours and dollars the effort has taken.

Chas. F. Irish,
Chas. F. Irish Co.,
Cleveland, Ohio.

* * * *

QUESTION: In taking trees down along city streets I would like to know what other cities do with their stumps. We digs ours out and fill in the holes which is probably the most expensive. With the new chain saw on the market now I would like to change this system and leave the stumps in the ground, if someone could put across to me a better way. I refer mainly to the stumps rotting in the ground and someone falling and getting hurt and suing the city.
Virgil B. Cooper.
MICHIGAN.

ANSWER: In Columbus, Ohio, where we will have to remove 100,000 trees within the next five years, we leave the stumps three feet high. With us its a job of getting the trees down and eliminating the danger to persons and property. Our city law department informed us that if we leave the stumps three feet above the ground level, persons can observe these stumps as they pass them, and they cannot be considered a hazard. If these same stumps were left only a foot high they could be considered a hazard, and there would be the possibility that the city could be sued.

We have whole streets lined with stumps, they don't look good but they don't fall on any one. When you can, it is desirable that you remove the tree and the stump, and have the job over with even if it does cost more.

As with us you can readily see its something else. Many people ask us why we don't cut stumps even with the ground, especially since we have electric tree cutting equipment "you all know the answer to that one." Many other people tell us to bore holes in the stumps and put in kerosene, turpentine, snake oil or something else, and in a few months all you have to do is walk right up to the stump and push it over. Maybe we don't bore the holes right or something, but for us they just won't push.

At least 50 per cent of the stumps we leave are American elm which have died with Phloem necrosis, with this disease the physical breakdown of the wood seems to be very rapid, and I think I can say here that a two-foot American elm stump that has been cut for seven years won't be much of a problem to remove. Of course when these stumps decay and are finally removed, there will necessarily have to be a hole left where the stump was, there could be some damage here where someone might step into one of these holes, but I don't think there would be much. You can just about depend on the property owners who have stumps to let you know.

Ray S. Dietz,
Supt. of Parks,
Columbus, Ohio.

* * * *

QUESTION: How can DDT be best used to combat the Japanese beetle? Is it effective when sprayed into the turf for the control of the grub?
Robert E. Tillgren,
City Forester, MASS.

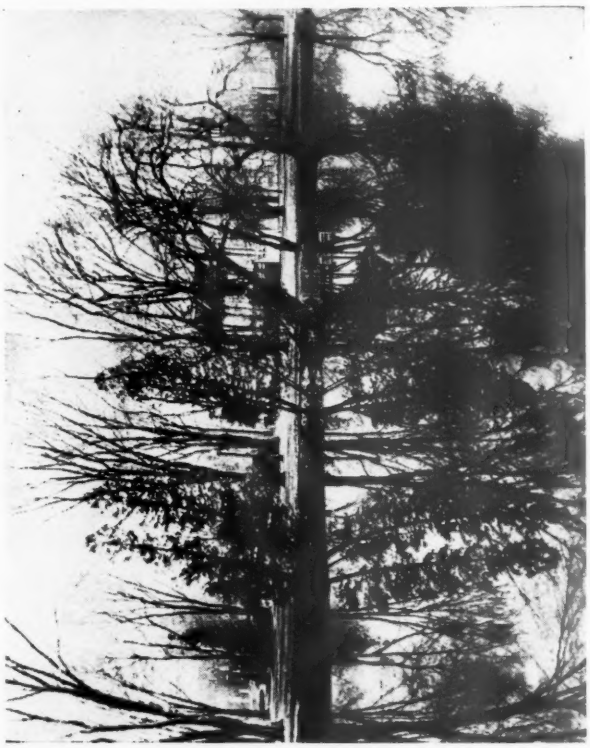
ANSWER: DDT is one of the most effective insecticides for the protection of fruit and foliage from attack by the adult Japanese beetles and for the control of grubs of the Japanese beetle in the soil but there is much yet to be learned before it can be recommended generally. For the benefit of those who wish to try this new material, available information is summarized herewith.

Those who use preparations containing DDT should understand the nature of the material and exercise due caution in storing, handling, and applying it. DDT is a nerve poison. One should use the same care with preparations containing DDT as with such well-known insecticides as lead arsenate, calcium arsenate, paris green, and sodium fluoride. Special care should be taken when DDT is used with oil to avoid contact with the material.

Control of Adult Beetles

Ornamental trees and shrubs may be protected from attack by the adult beetles by spraying them just as the beetles begin to attack them. The spray is prepared by mixing one pound of actual DDT in the form of a wettable powder (for example, 2 pounds of a 50 per cent or 2.5 pounds of a 40 per cent mixture) in 100 gallons of water. A second application, about two weeks later, may be necessary to protect the new growth. While such sprays have protected the foliage, they have not entirely prevented the beetles from damaging the flowers.

Many types of plants have been sprayed with DDT. Of these plants only a few were injured in any way by the chemical. Spraying caused some injury to the foliage of red maples and spotted the blooms of petunias and roses; it definitely retarded the growth and yield of soybeans. In many cases, different species of red spiders or spider mites have increased to destructive numbers following the application of DDT. Gen-



ODDI-TREES

This is not the picture of a giant Redwood but rather is a springtime scene in Victoria Park, Kitchener, Ontario. Turn the picture on its right side and you will see the solution of this photographic freak

—Photo courtesy Julius M. Tisch

erally safe, effective, and satisfactory measures for the control of mites are not yet available. The possibility of serious mite damage should be taken into consideration in planning a Japanese beetle control program.

Although DDT is less poisonous to man and to warm-blooded animals than to insects, it is by no means harmless. It is definitely poisonous to man and warm-blooded animals when considerable amounts are eaten or take up by the system. Care must therefore be exercised in using fruit sprayed with the material. Analyses indicate that when one application is made two weeks or more before harvest, the residue on the fruit should be well below the amount considered dangerous. However, when more than one application of DDT is made two or three weeks before harvest time, there may be an excessive amount of residue on the fruit. Such fruit could well be peeled before use.

Control of the Grubs

Japanese beetle grubs in lawns may be controlled by applying a 10 per cent dust to the surface at the rate of 250 pounds per acre. Pyrophyllite and talc have been found satisfactory as diluents for the DDT. The dust should not contain an adhesive. Small areas may be treated by broadcasting the dust over the surface by hand, as uniformly as possible, but large areas can be treated more economically by using a fertilizer distributor. When spraying equipment is available, a wettable powder containing 25, 40 or 50 per cent DDT may be suspended in 1,000 gallons of water and sprayed over an acre. One hundred pounds of the 25 per cent, 62.5 pounds of the 40 per cent, or 50 pounds of the 50 per cent dust should be used in 1,000 gallons of water. When rains are frequent, the material adhering to the blades of grass is soon removed, but during dry weather it can be readily removed by sprinkling the lawn. The best results have been obtained when the treatment was applied in the spring. The present indications are that the treatment will be effective for at least two years.

For the control of the grubs in vegetable gardens and in flower beds, the DDT dust or spray should be applied in the same manner as in treating lawns. The material should then be mixed with the upper 3 to 4 inches of soil by cultivation.

Many different grasses, including redtop, creeping bent, perennial ryegrass, and Kentucky bluegrass, were found in the established lawns treated with DDT. None of them were injured.

Applying DDT to the soil of vegetable gardens may reduce the growth and yield of bush beans, lima beans, soybeans, onions, spinach, and tomatoes but may have no deleterious action on the other vegetables commonly grown. Strawberries may be retarded or killed by the treatment. Present indications are that there is little hazard in eating vegetables grown in soil treated with DDT.

Many different ornamental trees and shrubs have been grown successfully in soil treated with DDT, including azaleas, barberry, box, false-cypress, dogwood, cotoneaster, ginkgo, inkberry, holly juniper, red cedar, laburnum, Oregon grape, spruce, pine, Douglas fir, firethorn, roses, yew, and arborvitae.

C. H. Hadley,
Japanese Beetle Investigations,
U.S.D.A., Morestown, N. J.

REPORT ON TREATMENT OF AN ELM TO CONTROL SLIME FLUX

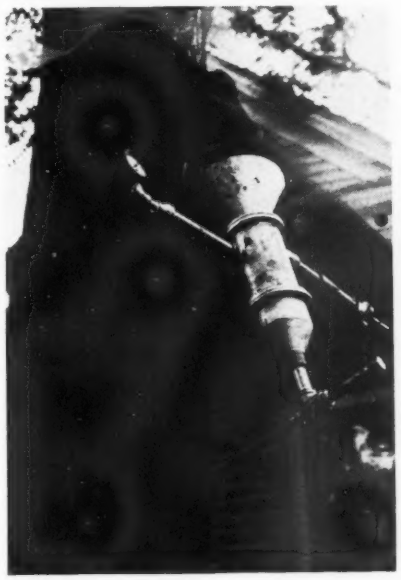
By CHARLES F. IRISH,
Charles F. Irish Co.,
Cleveland, Ohio

In 1926 we transplanted a 9" elm which grew very well but in 1940 showed evidence of slime flux. This resulted in the killing of an area of bark 30" long and 15" wide on the trunk. By 1946 the tree had died back in the central top and the effluent exuded from the face of the scar and stood in a puddle at the base of the tree. In addition it dripped from 4 drain tubes.

In June 1946 the tree was treated with sulfanilamide placed in 1/2" holes bored 2/3 of the diameter of the trunk. The following months there seemed to be some slacking of the fluxing but this could have been due to normal seasonal change rather than to any toxic effect of the sulfa on the bacteria present.

In June 1947 a great reduction in the amount of fluxing was noticed, the large scar was dry except for one small area which was only moist. Two of the drain tubes were dry and the flow was greatly reduced in the others.

Probably the most encouraging thing was not so much the reduction in flow but the vigorous growth and absence of further die back and the absence of the typical sour odor of the fluxing effluent.



The Irish Aero-fertil gun converted for the purpose of injecting sulfa under pressure for control of slime flux

In view of this improvement the tree has been given a second application of sulfa injected into the tree under 100 lbs. pressure to the square inch.

Quit complaining about those tools you want and can't get. Look what these Frenchmen in Luxembourg Gardens, Paris, are still using to prune trees. This picture was taken by John Michalko, Assistant Horticulturist of the Cleveland Division of Shade Trees, while on leave during the last war.

"Use of Mist Blowers in Applying DDT for Local Control of Mosquitoes"

Early in July, 1946, a 6% solution of DDT was applied by the B. F. Lawrence Tree Expert Co. on the property of the Weldon Hotel in Greenfield, Mass. Prior to the application, guests of the Hotel were unable to take advantage of use of the lawn because of the nuisance created by the presence of mosquitoes in quantities. From the time of treatment through the remainder of the summer this nuisance was completely abated, and incidentally, the spray operations resulted in the elimination of a heavy infestation of Japanese beetles and also of rose chafers.

Incidentally, at the time of this treatment, there were many annual flowers of various types in bloom. The application of oil on the delicate flower tissues did not in any way result in burning. This incident is simply mentioned because of the fact that many commercial pest-control sprayers are afraid to use oil solutions.

NAA NEWS

National Arborist Association, Inc.
A Trade Association

By Paul E. Tilford, *Secretary*
Box 426, Wooster, Ohio

The United States Department of Commerce has defined a trade association as: "A voluntary nonprofit organization of business competitors (usually in one branch of manufacturing, distributing, or service fields), the objective of which is to assist its members and its industry in dealing with mutual business problems."

There are about 8000 trade associations in the United States and one-fourth of them are national or interstate in scope. Membership in the various associations ranges up to 20,000, but the majority have a membership under 200.

The National Arborist Association, Inc., is a trade association. In general its objectives are to advance the interests of the shade tree preservation industry; to collect, preserve, and circulate among its members valuable and useful information relating to the business of arboriculture; to encourage wise and useful legislation and to oppose harmful legislation; to promote research to improve the practices of arboriculture; to maintain integrity, good faith, good will, and just and equitable principles of business in the industry; and to strive in all ways to promote the best interests of its members.

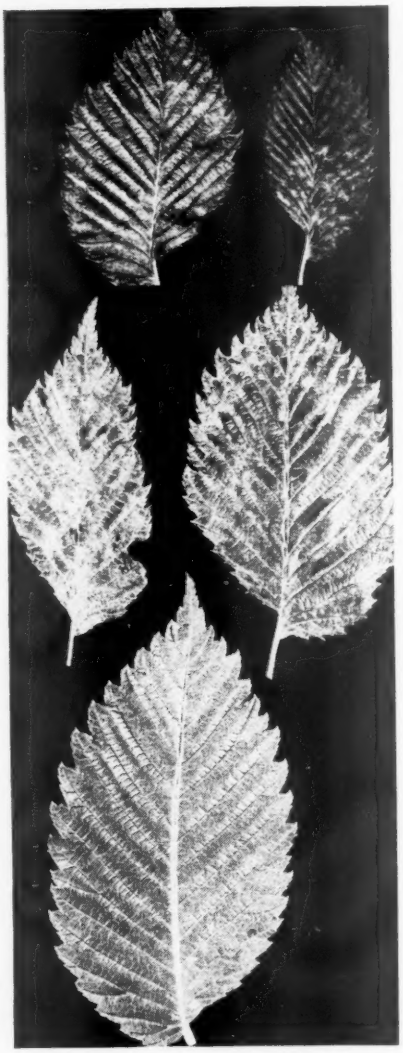
Membership in the association at the present time is 102. Members are located in 22 different states.

Requirements for membership in the National Arborist Association are that the individual or company shall have been in shade tree preservation work for at least three years; be able to furnish acceptable references who will vouch for the quality of work, credit and business ethics of the applicant; and membership in the National Shade Tree Conference.

2, 4D Injury on Shade Trees

2, 4D, the magic weed killer, has caused some interesting cases of injury on shade trees this season. A few days ago six small oaks growing on the campus of a northern Ohio college came to my attention. The early leaves on three of these trees showed typical 2, 4D injury. Most of the later leaves appeared normal. Leaves on the other three oaks were normal in every respect.

No 2, 4D had been used on the lawn near these trees and the caretaker could not explain the injury. It so happened that the three injured trees were infested with scale. After some discussion it was recalled that these three trees were given a dormant oil spray to control the scale. The oil had been applied with a five-gallon hand sprayer which had been used to apply 2, 4D to lawns last fall. Enough of the material remained in the sprayer over winter and was applied along with the oil spray when the trees were still dormant to cause severe malformation of the early foliage.



—Photo courtesy Paul E. Tilford.

The top four elm leaves are infected with elm mosaic and show the mottling and dwarfing effect of the disease. The bottom is a normal elm leaf.

Two cases of injury to the foliage typical of that caused by 2, 4D over the entire crowns of large oaks and elms have been observed this season. In these instances the trees were not sprayed with equipment formerly used in applying 2, 4D. The lawn areas around the trees were treated with 2, 4D last fall. Because of the size of the trees and the uniformity of the injury over the entire crown it hardly seems probable that the injury was caused by drift at the time the lawns were treated. Other nearby trees, some with branches touching the injured trees, were normal. It is hard to explain. Did the injured trees take enough 2, 4D through their roots from the soil to cause the injury?

One thing is certain—2, 4D is a powerful chemical and affects some plants at extreme dilutions. Dr. A. M. S. Pridham reported early this year on an experiment where red kidney beans were sprayed with 2, 4D when the pods were ripening. Seedings grown from the seed produced by these bean plants showed characteristic 2, 4D injury.

Elm Mosaic

Elm mosaic, a virus disease of American elm, is widespread. Recently many typical cases of mosaic were observed at St. Louis, Missouri, and in Westchester County, New York. The disease is prevalent in Ohio and other midwestern states.

Symptoms of the disease on different trees are variable, in fact they vary on the same trees from one year to the next. Many times diseased trees can be distinguished from a distance because the leaves tend to be in tufts or bunches rather than distributed in a normal manner on the twigs. Usually some leaves on diseased trees are normal in size and texture, whereas others on the same trees may be abnormally large or small, stiff, and frequently distorted. The small leaves show typical yellow and green mottling accompanied by rugosity. On some trees the mottling is more diffuse and not as distinct as on others. Mild to moderate brooming of branches may occur which to some extent accounts for the tufted appearance of the foliage. There is no discoloration of bark or wood in either the tops or roots but the wood of affected trees seems dry and is often brittle. Diseased trees generally decline in vigor from year to year and become unsightly because of thinning of the foliage and death of scattered branches. Thus far, none of the diseased trees under observation has died but several of them have been removed because they became so unsightly. No cure or control for the disease is known.

SPRAY TALLEST TREES

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JOHN BEAN SPRAYERS

Successful shade tree spraymen insist on sprayers with power and capacity to handle any spray job quickly and efficiently; to reach "top-center" of the tallest trees with enough "drive" for thorough coverage. John Bean builds these sprayers . . . field-tested machines, famous for their ability to "take it"—to keep going year after year under rough, tough usage. Powerful Bean Royal pumps are all-enclosed—dust and dirt sealed out, performance sealed in. Spray guns are scientifically designed for easy, efficient operation. Bean non-corrosive, all-steel tanks can be cleaned after using with 2, 4-D because they do not absorb spray materials. Available with 400-, 500-, or 600-gallon tanks.

Equipped with a Spraymaster gun, your Bean Shade Tree Sprayer is ideal for spraying flowers, lawns, shrubs, with fertilizers, fungicides, or insecticides. A twist of the wrist changes spray from soft mist to driving spray or solid stream.

Built and tested for the job, John Bean Shade Tree Sprayers are economical to operate. Service is prompt. Investigate this famous line of sprayers today. They will help you to make money and save money.

See your nearby dealer, or write for free catalog.

JOHN BEAN MFG. CO.

DIVISION OF FOOD MACHINERY CORPORATION

LANSING 4, MICHIGAN

Attend the National Shade Tree Conference, August 18 - 22nd

The Legend of the Dogwood Tree

By Mrs. C. L. Hammond,
Cincinnati, Ohio

In Nature's Great Gardens through out the length and breadth of this country, and many lands abroad, grow the Dogwood trees. In the month of May their blossoms are so profuse that it seems as if a late snow storm had descended and forgot to melt away or that a pink cloud had escaped from the sunset and had settled down in the quiet wood. Later it paints the landscapes with lovely Autumn colors of scarlet, crimson and gold. Berries, flashing red from deep in the late foliage attracts scores of chattering birds who stop over for the luscious repast before continuing their journeys to the balmy southland.

A legend records that many years ago, when Jesus was tramping the trails and footpaths along the seashores and thru the hills of Galilee and adjacent lands, the Dogwood grew to great size, larger than our domestic oaks and pines. It grows especially abundant in Palestine and Galilee, so when the Son of Man was sentenced to die on the cross for the sins of a wicked people the Dogwood was chosen and it was on the sturdy cross arms from the wood of the beautiful tree that the Saviour hung while quakes shattered the earth and the temple veils were rent to shreds.

The Dogwood trees were very unhappy because of their shame and indignantly were on the point of refusing to send out their blossoms to beautify the landscapes of the Holy Land any more when Jesus sensed their grief and shame and threat.

Walking among the trees in the Garden of Gethsemene after He had risen on Easter morning He talked with them but failed to assuage their grief. Fearing that mankind would lose the beautiful trees if they persisted in holding back their blossoms forever, Jesus made a promise that He would arrest the growth of the trees to such a stage that they would never again gain such size or strength that their branches could bear the burden of a man, if the trees would continue their beautiful blossoming. This He proceeded to do much to their joy, and without detracting from the beauty of the tree. And this is the promise Jesus made so many years ago in the bright Garden of Gethsemene:

"Never again shall the Dogwood Tree grow large enough to be used in making a Cross. Henceforth it shall be slender and bent and twisted and its blossoms shall be in the form of a Cross with two long and two short petals. And in the center of the outer edge of each petal there shall be nail prints, brown with rust, stained with blood, and in the center of the flower will be a crown of thorns. All who see it will be reminded that on the Dogwood Tree I was crucified. This Tree shall not be mutiliated or destroyed but cherished and protected as a reminder of My agony and death upon the Cross."

So come next Spring and you find a gnarled and bent little tree on some one's lawn or nodding its pink or white faces to the breeze from some nearby woodland, you may know that it is the Dogwood. And if you look closely you may see the sad story of the crucifixion written in rust and blood on the beautiful faces of those four petaled blossoms. And you'll form right there a deep and abiding love for the beautiful little tree.

SPRING PRATT'S Sprays SUMMER

Specializing for Over 42 Years in Sprays for the Public Sprayer.

- SCALECIDE—The safest of all dormant sprays for shade trees. The only oil spray containing a combination of vegetable and mineral oils for greatest kill of insects and safety to trees.
- SUMMER SPRA-CREAM — A creamy white, 83% stabilized emulsion of oils, especially selected for high insect control and safety. Used both as a Spring spray on evergreens and ornamentals—also as a Summer foliage spray.
- D-X SPRAY—A widely used spray for the control of sucking and chewing insects. Contains 1% rotenone, .37% pyrethrins and 5% DDT.
- PRATT'S DDT SPRAYS are especially developed for shade tree work. Proper formulation of DDT compositions is the key to successful results.
- PRATT'S 50% DDT—A dry wettable DDT that is micronized* to extreme fineness. *Trade Mark Reg. Micronizer Processing Co., Moorestown, N. J.
- PRATT'S 25% DDT—A soluble DDT in a glyceride vegetable oil base of great safety to foliage.
- PRATT'S Emulsifiable 25% DDT—An emulsifiable DDT in an aromatic petroleum derivative base with emulsifier.
- PRATT'S S-30 DDT—A 30% DDT dissolvent in a solvent. Dilutes in kerosene or light petroleum fraction for airplane, mist or fog sprayers.

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B. G. PRATT COMPANY
Hackensack, N. J.
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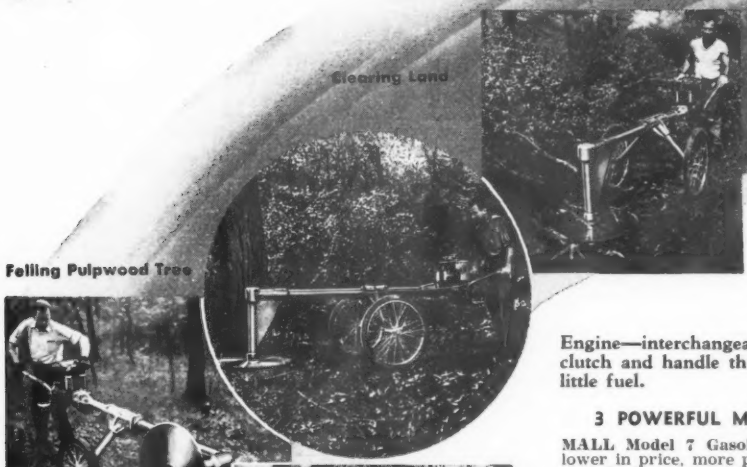

No tree too tough—no place too remote for these powerful Mall Gasoline Engine Saws. They clear land of brush, fell and buck pulpwood, mow down and buck trees up to 12-foot diameter in a fraction of the time required by hand. The sturdy Mall Gasoline Engine—interchangeable on all 3 Mall Power Saws—has a stall-proof clutch and handle throttle, starts easily in all weather and uses very little fuel.

3 POWERFUL MODELS FOR 1 AND 2 MAN OPERATION

MALL Model 7 Gasoline Engine CHAIN SAW (A 1 or 2-man tool) lower in price, more powerful, lighter in weight—24-inch model weighs only 75 lbs.—more compact in design. Can be easily transported over rough terrain . . . operated with a minimum of clearance . . . and used successfully after a few instructions. Mows down trees up to 12-feet in diameter. Cutting chain swivels for any angle cut; automatic, stall-proof clutch keeps engine running when saw chain is jammed in cut. Immediately available in 18-inch to 12-foot cutting capacities. Also Pneumatic and Electric Models and Electric Chain Sharpener.

MALL Model 30 CIRCULAR SAW (A 1-man tool) for clearing land—felling and bucking timber and pulpwood. Entire unit weighs only 200 pounds. Costly manufacturing methods reduce weight and make saw more productive for every user. Over 100 pounds lighter than any saw of this type, it can be used on rough terrain where heavier machines are too tiresome to move and use. The automatic centrifugal clutch stops blade from revolving while engine idles. Circular blade can be indexed for notching, bucking and limbing cuts from operating handle without touching blade, an exclusive feautre. Available with 30 or 36-inch cutting blade.

MALL BOW CHAIN SAW (A 1 or 2-man tool) for smaller timber or pulpwood. Bow design prevents pinching of chain in cuts. Equipped with powerful gasoline engine with automatic clutch. Engine is interchangeable for use with proper attachments as power circular saw. Available in 18-inch cutting capacity.

Mail coupon at once for FREE booklet "Mall Power Saws" and name of nearest Mall Dealer. Demonstrations can be arranged.

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No. 10 Pole Saw, in stock. Consisting of 12 ft. octagon handle, Disston Socket Head and 16" curved blade.

JUST RECEIVED: Carload of Tree Surgery Cable. Sizes 3/16, 1/4, 5/16 and 3/8". 7 Strand, soft steel, double galvanized.

Visit Our Booth at the National Shade Tree Conference in Cleveland

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WEST CHESTER, PENNA.

DDT Formulations Vs. Field Of Application

Many types of DDT compositions have appeared on the market and appreciating the confusion that may be in the minds of the public, Geigy Company, Inc., "Originators of DDT Insecticides," feels that there is need for clarification on the subject. There are probably two major reasons for the wide variety in DDT preparations. One stems from the fact that certain types of these insecticides are more adaptable for application to control specific pests. Secondly, the character of the surfaces upon which the preparation is to be applied is often a factor associated with economical operations, deposit of DDT and appearance following treatment.

The formulations appropriate for application on plant material may be properly placed in the category of dusts, wettable powder sprays, atomized oils and emulsifiable solutions.

Spraying of building surfaces may be most satisfactorily accomplished through the use of wettable powders and emulsifiable solutions. For porous surfaces, such as wood, brick and plaster, where a white residue is not an adverse factor, a wettable powder containing DDT should be employed. In these instances, one reason for not using an oil solution is due to the fact that upon penetration of the surface, by the liquid, a portion of the DDT is made inaccessible for insect control. On the other hand, where a minimum of visible residue is paramount following surface treatment, it is preferable to use a water base spray containing an emulsifiable DDT composition. Irrespective of material applied, Geigy has observed that one of the major reasons for decreasing efficacy of DDT deposits is that dust may cover the exposed surface and hence reduce the chance for flies and other insects to contact DDT crystals.

The treatment of animals for certain external parasites is best accomplished through wettable powder sprays or dusts. A 10% DDT dust is particularly valuable during the season when dipping or spraying is inadvisable. Carefully formulated emulsifiable solutions may be employed if due care is exercised in their application.

Mosquito control through the treatment of hedges and other types of vegetation surrounding the home may be best accomplished by using one of the wettable powder sprays.

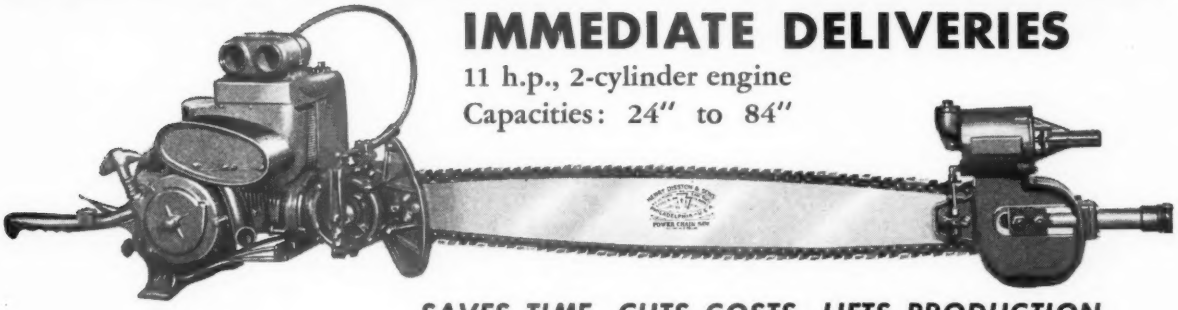
On the other hand, in treating bodies of water for control of mosquito larvae, non-wettable dusts and oil solutions are preferred. They tend to stay on the surface of the water and do not readily sink as happens in the case of wettable powders and emulsions.

Rather than attempt to suggest dosage of DDT composition used, Geigy urges adherence to recommendations of the state agricultural college or of the manufacturer.

NOTICE

Due to the space required for the National Shade Tree Conference we were unable to run the second part of J. F. Wischhusen's article, "Essential Elements In Tree Nutrition" in this issue. It will be concluded in October.

DISSTON CHAIN SAW
with Mercury Gasoline Engine



IMMEDIATE DELIVERIES

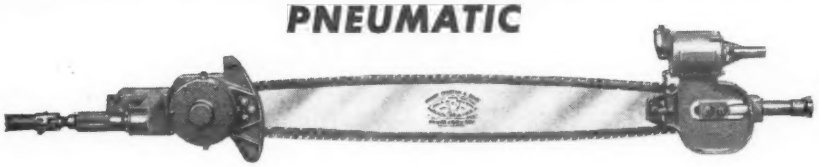
11 h.p., 2-cylinder engine
Capacities: 24" to 84"

SAVES TIME, CUTS COSTS, LIFTS PRODUCTION

The Disston Chain Saw is a self-contained, portable, gasoline powered saw that can be operated in all climates. It is ruggedly built, light in weight, easy to operate and cuts from all angles. It results in greater production and economy wherever heavy timbers are cut . . . in the forests; on railroads and contracting jobs; at shipyards and manufacturing plants of many kinds.

The engine, designed specially for chain saw operation, has more power per pound of weight than any other chain saw engine. It is manually controlled to utilize full engine power under all cutting conditions. Other features include: die-cast engine cylinders and cooling fan; gear driven magneto; fuel filter built in tank; air filter; positive acting multiple disc clutch; many others. And the tough, durable cutting chain gives perfect contact with drive sprocket under all load conditions.

DISSTON CHAIN SAW
PNEUMATIC



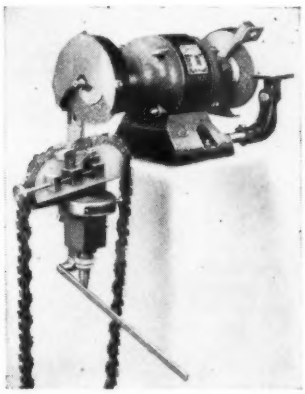
HUNDREDS OF APPLICATIONS

The Disston Chain Saw—Pneumatic—is a powerful, light weight, air-driven tool that speeds up timber cutting for general contractors, railroads, shipyards. Can be operated wherever compressed air is available, even under water. It requires no previous experience to operate, and is ready for work the instant connection is made with air supply.

Gear housing and saw mechanism may be rotated in either direction—handle grips remain in a horizontal position with relation to each other for any type of cutting. Equipped with heavy-duty, vane-type motor. Tail stock, guide rail and cutting chain are the same as those used on Disston gasoline powered saw. Requires little maintenance for it is built for long, economical service.

3½ and 5 h.p. motors in 24" and 36" sizes. The 3½ h.p. motor requires 90 cu. ft. of air per minute, at 90 lbs. pressure per sq. in.; the 5 h.p., 150 cu. ft. of air per minute at 90 lbs. pressure per sq. in.

Write for further particulars, or see your Disston Distributor, who carries complete stocks of parts and is prepared to render prompt and expert service.



DISSTON ELECTRIC CHAIN SAW SHARPENER

enables you to do your own sharpening . . . quickly, accurately. Saves time. Keeps chains in first class condition.

HENRY DISSTON & SONS, INC., 870 Tacony, Philadelphia 35, Pa., U.S.A.

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S. F. Potts

(continued from Page 9)

feet with this blower. With specially designed equipment it would seem possible to drive finely atomized spray to considerably greater heights where there is no wind movement.

Under suitable conditions the blower used at Gulfport was capable of drifting a cloud of dust horizontally about 250 feet, but beyond the first 20 feet there would not have been a deposit adequate to control insects. The droplets in the fine spray mist driven by this blower, however, were deposited for a distance of fully 100 feet in sufficient numbers to give good control of insects. Recent experiments indicate that a machine of this design could be used effectively for treatment of certain broadcast crops by covering 100-foot strips, thus avoiding considerable crop damage that might be caused by usual methods of treatments.

Aerial Application of Sprays.—In the application of liquid sprays from aircraft the size of droplets greatly affects the width of the swath covered, the distance the spray cloud will drift, the settling rate, the penetration of the ground cover, and other factors. Measurements of droplet size and width of swath were made at Whitesbog, N. J., in 1937, when an autogiro was used for applying two concentrated sprays. In these tests lead arsenate spray, with and without a wetting agent, and pyrethrum extract in kerosene were used. The spray mixtures were atomized by being spun off from rotating disks. They were applied at the rate of 3 gallons per acre. When released 20 feet above the ground or 20 feet above the treetops, the lead arsenate spray that contained no wetting agent treated a swatch 75 feet wide.

The average droplet size was calculated by counting the number of droplets per given area and dividing the total deposit per given area, as found by chemical analyses, by the number of droplets. There were 25 droplets per square inch on plates placed on flat ground and 43 droplets per square inch on foliage in a sprayed woodland. The diameter of the droplets averaged approximately 240 microns. The addition of a wetting agent reduced the droplet diameter to about 200 microns and increased the width of the treated swath to 90 feet. With the pyrethrum extract-kerosene concentrate a swath about 100 feet wide was treated, the droplets being somewhat smaller and lighter than those in the lead arsenate spray mixture.

In aerial application the use of a larger droplet was necessitated by wind, upward air currents due to heat radiation, layers of heavy, humid air above the treetops, and small irregular areas and rugged terrain. Low flying over large areas of level terrain makes practicable the use of smaller droplet sizes, and therefore lower gallonage, at lower costs. For low flying over crops it might be practicable to use average droplet sizes as small as 60 to 70 microns. Except where it is necessary to kill insects under heavy canopy, larger droplet size would be preferable for the treatment of forested areas.

Droplets of high density (1.3 to 1.6) can be deposited in smaller sizes than those of lower density (0.8 to 1.0). For droplets with a density of 1.0, and of various diameters, the time required to fall 50 feet, in ordinary still air at a temperature of 23°C., is as follows:

Diameter (microns)	*Time*
200	13 seconds
100	51 seconds
80	1.3 minutes
50	3.4 minutes
40	5.2 minutes
20	21.0 minutes
10	1.4 minutes
10	1.4 hours
5	5.5 hours
1	5.0 days

Upward or downward air currents will change the rate of rise or fall, but wind velocity does not alter it (Miller, 1935, p. 160). The rate of fall of droplets of different sizes was computed by Stoke's law according to the formula: for measuring rate of fall of small spheres. Other things being equal, the smaller the droplets and the longer they float in the air the greater the evaporation and drift. Temperature, humidity, wind velocity, and chemical characteristics also affect evaporation and drying of the particles. Considerable evaporation reduces the size of the drops and makes them fall more slowly and drift farther. Some increase in size and weight of falling particles has been obtained by the addition of Yumidol, (a hygroscopic hexahydric alcohol) carbowax. Phosphorus pentoxide, magnesium chloride, and calcium particles greatly increase in size and weight as they float in the air, but when mixed with an insecticide these chemicals cause injury to some kinds of foliage.

The distances that a droplet 100 microns in diameter and having a specific gravity of 1.0 would drift while falling 50 feet in air moving parallel to the ground are as follows:

Miles per hour	*Drift (feet)*
¼	22
½	45
1	87
2	175
3	265
4	348
5	435
10	765

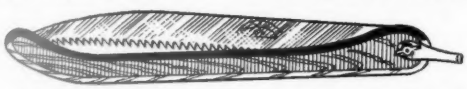
(Continued on next Page)

FANNO TREE SAWS

TREE SURGERY SAW No. 8

Like all Fanno Saws designed for fast cutting. Especially adapted to tree work. Blade 22 inches long, 5½ points to the inch. Fitted with a hardwood handle, very strongly designed, re-enforced with vulcanized fibre set in water proof glue. A trial will prove our claim.

NEW IMPROVED TREE SAW No. 10



One of the FASTEST CUTTING saws of its kind on the market today. The pitch of the teeth and angle it is hung on handle make this NEW SAW outstanding in the Tree Service Field. Folds into handle making a safe and convenient Saw to carry. Has 20 inch Blade and 20 inch Handle. No Scabbard required; fastened to strong beechwood handle with ¼ inch rustproof bolt and wing nut.

Send for our illustrated circular showing the complete line of Pruning saws and Tree Surgery saws that we manufacture.

Our best wishes for a most successful National Shade Tree Conference

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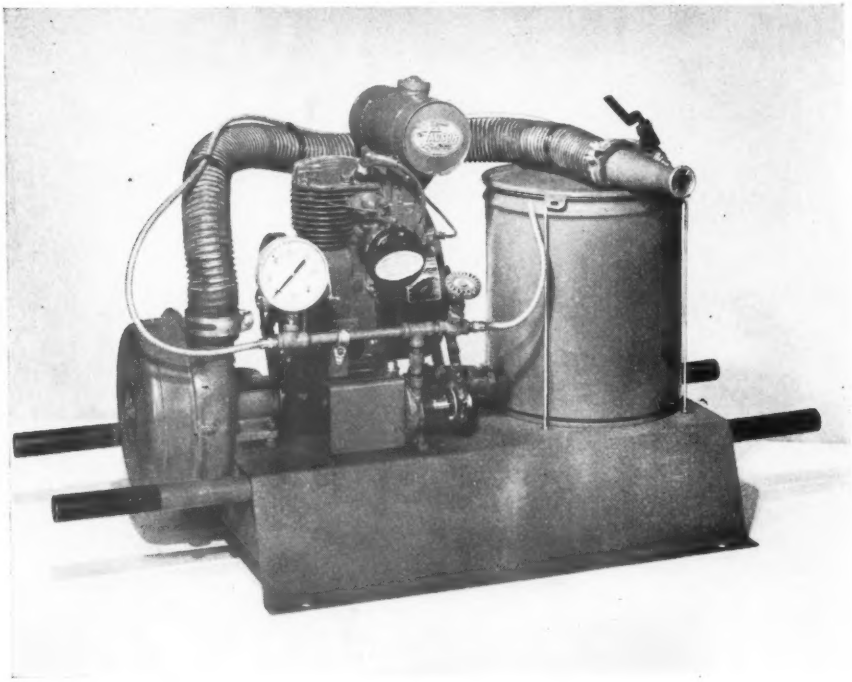
This method embodies and utilizes the new highly-effective procedures developed by S. F. POTTS, distinguished Government entomologist, as described by him recently in TREES.



The Feller-Jones Mist Blower

eliminates

(a) Long hose lines
(b) Danger of staining houses, automobiles, etc.
(c) Need for large quantities of water. One gallon of concentrate properly used with this machine is equivalent to hundreds of gallons of conventional diluted spray material.

Wheelbarrow type. Weighs less than 100 lbs. Can be operated by one man.

IDEAL for insect control (including mosquito control) in orchards, nurseries, greenhouses, warehouses, livestock areas, and shade-tree plantings in parks and streets.

The Feller-Jones Mist Blower

gives you—

1. Better cover of both sides of leaves, and therefore better pest control.
2. Faster application than pressure sprayers.
3. Versatility. The Feller-Jones MIST BLOWER is adaptable for use with fungicides and hormones as well as all types of liquid insecticides.

CONCENTRATES

The best results will be obtained with the FELLER-JONES MIST BLOWER when used with properly formulated concentrates. Write us fully for information. Tell us your pest problem, and we will advise the proper concentrate.

Feller-Jones Mist Blower, Inc.

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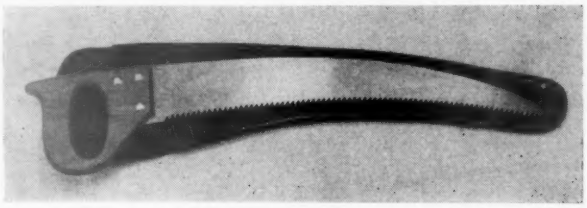
One customer says "Since receiving your saw it has been used together with another we have used for twenty years. It cuts twice as fast on all sizes of cuts."



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Hardie Shade Tree Sprayers provide the big capacity and high pressure to make spraying from the ground quick, thorough and economical. Many models meeting every spraying need. Write for Catalog. The Hardie Mfg. Company, Hudson, Mich., Los Angeles 11, Calif., Portland 9, Oregon. Export Dept. Detroit 26, Mich. Canadian Office C. W. Lewis, Grimsby, Ontario.

Hardie DEPENDABLE SPRAYERS
THE ONLY SPRAYER THAT IS COMPLETELY LUBRICATED

A droplet 200 microns in diameter should drift practically one-fourth and a 50-micron droplet should drift about four times the distances given. Drift calculations are based on the formula

$D = Kh$, where D = drift, K = speed of wind, and h = distance rate of fall of fall.

Smoke Aerosols.—In 1930 and 1931 field tests were made with smokes containing arsenicals, oil, rotenone, pyrethrum, and nicotine. Practically no particles in the smoke aerosol cloud were deposited, nor was any appreciable mortality of insects obtained. In some cases the insecticide broke down on account of heat. Smoke particles range from 0.3 to 2 microns in diameter and are not smaller than many particles *of lead arsenate and calcium dusts.* Smokes differ from dusts, however, in that the particles in a smoke cloud move as individual, unattached particles, whereas in a dust cloud the particles often occur in groups, or agglomerates. Individual dust particles less than 35 microns in diameter cannot be seen on slides or on foliage with the unaided eye, but groups of dust particles can readily be seen without magnification.

Liquefied Gas Aerosols.—In liquefied-gas aerosols this gas, such as Freon-12 dichlorodifluoromethane or methyl chloride, comprises from 40 to 90 percent of the aerosol solution. When released, the liquefied gas volatilizes quickly and the droplets immediately become smaller. Any further reduction in droplet size would depend on the solvent and volatile ingredients in the solution; therefore the droplet diameter could be the same as in mechanically atomized sprays containing the same solvent.

For application of liquids, very small droplets, 4 to 40 microns in diameter, can be obtained either by atomizing with liquified gas or with mechanical atomizing equipment. Suspensions of solid particles, such as cryolite and lead arsenate, can be applied with mechanical atomizing equipment, but not with liquefied gas. To deposit on the foliage the same number of droplets of given size by liquefied gas as by the mechanical method it is necessary to apply a larger volume of liquid, the quantity depending on the proportion of liquified gas in the solution.

Summary.—Particle size is an important factor in determining deposit, distribution and effectiveness of dusts and concentrated sprays. A field of resistance surrounds all objects, including plants and insects, and repels most individual dust particles of small size, as well as droplets smaller than approximately 30 microns in diameter.

Ordinary dust clouds consist of a mixture of individual particles and ag-

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Destruxol's DDT PYRENONE GARDEN SPRAY

Destruxol's SPECTACULAR NEW TWO-PURPOSE SPRAY

DDT PYRENONE

Gets SUCKERS Gets CHEWERS

Leaves no poisonous or unsightly residue . . . For full particulars write

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ALUMINUM OR COPPER SYSTEMS

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ARBORICULTURAL SUPPLIES

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WESTERN ARBORIST SUPPLY

Specialized Tools and Equipment for Arborists

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IRVING F. HUMPHREY
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Los Angeles 16, Calif.

glomerates of many particles attached together. If the particles are small, the deposit on insects and plants consists almost entirely of agglomerates.

Dust particles may be coated in the air by small droplets of oil, if the mixing takes place either in a vacuum or under pressure.

Fine atomization is necessary to obtain adequate distribution with low gallonage, but the droplets must be large enough to deposit on foliage and insects. Apparently for ground application most of the spray should be in droplets 30 to 80 microns in diameter. For aerial application most of the droplets should be 70 to 100 microns in diameter if the areas are large and flat, and as large as 100 to 300 microns for the control of certain forest insects on rugged terrain.

The number of droplets of given size that would be deposited per unit area per gallon of liquid distributed on an acre of surface is presented.

Other factors affecting particle or droplet size are concentration, type of distributing device, density and type of insecticide, rate of volatilization of the ingredients, distance to which the particles must be drifted, wind and other meteorological factors, volume and compactness of foilage, and settling rate.

LITERATURE CITED

Miller, C. W., 1935.—Introduction to physical science. Ed. 2, 409 pp. New York and London.

Potts, S. F., 1940.—Concentrated spray and mixtures and their application by ground and aerial equipment as compared with standard spraying and dusting methods.

U. S. Bur. Ent. and Plant Quar. E—508, 21 pp. (Processed.)

"Use of DDT Oil Solutions Through Mist Blower Applications in Control of Gypsy Moth"

During the federal fiscal year of 1946, the Division of Gypsy and Brown-Tail Moths Control located at 20 Sanderson Street, Greenfield, Mass., used blower apparatus in treating approximately 26 square miles of gypsy moth infested area. The solution used ranged from 12% DDT during the early work to 6% solution after egg hatch had been completed. The material was applied at rates ranging from ¼ to 1 gallon per acre. In all cases where the gallon dosage was used, based on checks as of this time, complete control was obtained. With lower dosages, excellent control was obtained in practically every case. Incidentally, these operations which were carried out during the period from approximately April 15 through the month of June did not result in any burning of foilage of any species of tree or shrub. Very careful checks of this operation demonstrated the effectiveness of DDT against practically every species of defoliators and many of the bark beetles including the vectors of the Dutch Elm Disease.

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Authors and Books

The following books may be ordered from TREES Magazine, Box 5607, Cleveland, Ohio.

THE BOOK OF TREES (Revised Edition) by Alfred Carl Hottes. A. T. DeLaMare Co., Inc., New York. 440 pp., Illus. $3.50.

If you enjoy reading about various trees you will love this book. It is a revision of an edition published in 1932. The author gives credit to three well-known American arborists for much of the material relating to the care of the various species—they are: Charles F. Irish, F. A. Bartlett and the late Martin L. Davey. Many others well known in the field of arboriculture are quoted.

The book is profusely illustrated and gives much cultural data on hundreds of well-known and little-known trees. Although written primarily, as the author states, for the layman, the professional will glean much from its pages.

There are chapters on tree repair, fertilizing, pests, pruning, transplating. The lists of trees for all portions of the country are well itemized as to flowering, drought resistance, trees for the seaside, etc., but could have been clearer in relation to the area best suited to the tree. Also some of the data included in the first edition and which is no longer recognized should have been deleted. All in all though, it is a book with a world of information and enjoyable reading.

Dr. Pirone at New York Botanical Garden

Succeeding Dr. B. O. Dodge, who was retired Jan. 1, Dr. P. P. Pirone comes to the New York Botanical Garden as Plant Pathologist. For the past ten years he has been Associate Professor of Plant Pathology at Rutgers University, New Brunswick, N. J. In 1942, '43 and '44 he was one of the instructors in the Botanical Garden's Two-Day Short Course in Disease and Pest Control. He is the author of "Maintenance of Shade and Ornamental Trees," a volume of more than 400 pages, published in 1941 by the Oxford University Press.

Dr. Pirone was graduated from Cornell University in 1929 with a Bachelor of Science degree. He had already begun his professional work in plant pathology by working on vegetable diseases for the A. A. Grinnell Company at Elba, N. Y., during 1927 and '28. Through an appointment on a Farm Bureau Fellowship, he continued his work on vegetable disease for four years in Nassau County on Long Island, while working for his Doctor of Philosophy degree.

The Ph. D. was awarded in 1933. The Dutch elm disease broke out about that time, and Dr. Pirone went to work at once for the Bureau of Plant Industry of the United States Department of Agriculture, serving as field assistant and project leader for eradication of the Dutch elm disease in New Jersey and in White Plains and Hempstead, N. Y.

In 1934 he returned to Cornell as Extension Assistant Professor of Plant Pathology, being placed in charge of research on diseases of ornamental plants two years later. Then in 1938 he went to Rutgers as Associate Professor. Dr. Pirone is widely known among commercial and private growers in every region where he has worked.

In addition to his book on tree care, Dr. Pirone is the author of many technical papers and popular articles, the former including descriptions of three new species of bacteria which he has discovered causing disease on poinsettias and Dieffenbachia. With other authors he has also written on leafspot diseases, London plane blight, and gardenia cankers, and he has translated from the Italian an early 19th century work on rust of grain. The New Jersey Agricultural Experiment Station in 1939 published an 80-page circular, "Diseases of Ornamental Plants," the revision of which he prepared.

At the New York Botanical Garden he will have charge of disease and pest control on all the ornamental plantings, and he will undertake research on diseases of ornamental plants.

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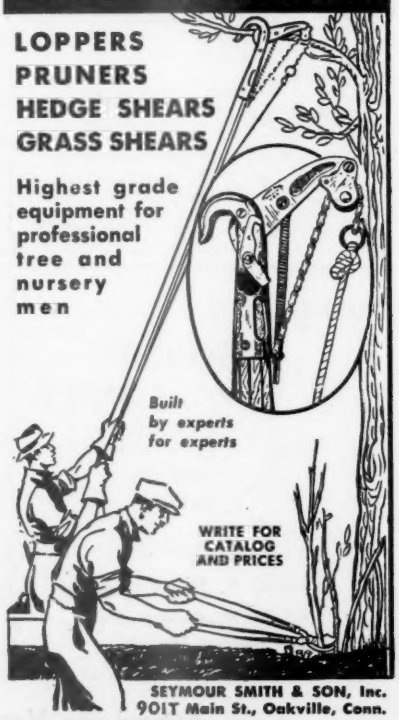

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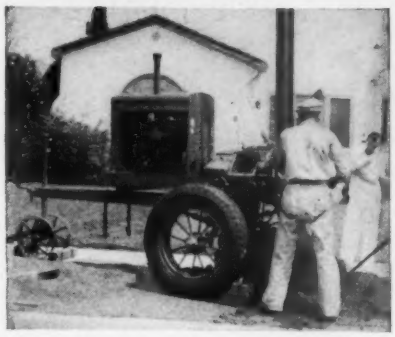

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